

CLAIMS

1. An information recording medium comprising:

5 a first recording layer and a second recording layer in each of which record information can be recorded,

said information recording medium including a plurality of block areas, each of which is a unit of recording the record information and each of which includes a partial recording area of said first recording layer and a partial recording area of said second recording layer located in a position 10 facing the partial recording area of said first recording layer.

2. The information recording medium according to claim 1, wherein at least one of the plurality of block areas comprises: a management information area to record therein management information for managing the record 15 information which is recorded into the at least one of the plurality of block areas; and a data recording area to record therein the record information.

3. The information recording medium according to claim 1, wherein a size of the data recording area of said first recording layer is larger than a size 20 of the data recording area of said second recording layer.

4. The information recording medium according to claim 1, wherein at least a last block area out of the plurality of block areas is in an unrecorded state such that the record information is unrecorded.

25

5. The information recording medium according to claim 1, wherein

dummy data is recorded in at least a last block area out of the plurality of block areas.

6. The information recording medium according to claim 1, wherein the
5 record information to be recorded in at least one of the plurality of block areas
is adjacent to an interlayer buffer area to record therein buffer data for
buffering a change operation of changing a recording layer which is a
recording target, between said first recording layer and said second recording
layer.

10

7. The information recording medium according to claim 1, wherein at
least one of the plurality of block areas is fixed-length.

8. The information recording medium according to claim 1, wherein at
15 least one of the plurality of block areas is variable-length.

9. The information recording medium according to claim 1, wherein
a pre-record address for determining a position where the record
information is recorded on said information recording medium is continuously
20 given in said first recording layer and said second recording layer, and
a physical address recorded with the record information onto said
information recording medium is continuously recorded in each of the
plurality of block areas.

25 10. An information recording apparatus comprising:
a recording device for recording record information onto an

information recording medium comprising: a first recording layer and a second recording layer in each of which the record information can be recorded; and

5 a first controlling device for controlling said recording device to record the record information by a unit of each of a plurality of block areas, each of which includes a partial recording area of said first recording layer and a partial recording area of said second recording layer located in a position facing the partial recording area of said first recording layer.

10 11. The information recording apparatus according to claim 10, wherein said first controlling device controls said recording device to provide at least one of the plurality of block areas with a management information area to record therein management information for managing the record information which is recorded into the at least one of the plurality of block areas.

15 12. The information recording apparatus according to claim 10, wherein said first controlling device controls said recording device to provide at least one of the plurality of block areas with an interlayer buffer area, by recording buffer data for buffering a change operation of changing a recording layer 20 which is a recording target, into each of said first recording layer and said second recording layer, when the recording layer is changed from said first recording layer to said second recording layer.

25 13. The information recording apparatus according to claim 12, further comprising: an ejection judging device for judging whether or not said information recording medium is ejected from said information recording

apparatus,

 said first controlling device controlling said recording device to provide the interlayer buffer area if it is judged by said ejection judging device that said information recording medium is ejected.

5

14. The information recording apparatus according to claim 12, further comprising: an ejection judging device for judging whether or not said information recording medium is ejected from said information recording apparatus,

10 said first controlling device controlling said recording device to provide at least one of the plurality of block areas with the interlayer buffer area having a smaller size than a predetermined size of the interlayer buffer area, if the record information is recorded over said first recording layer and said second recording layer,

15 said first controlling device controlling said recording device to provide the interlayer buffer area having the predetermined size, by recording the buffer data into an area following the interlayer buffer area having the smaller size, if it is judged by said ejection judging device that said information recording medium is ejected.

20

15. The information recording apparatus according to claim 10, wherein at least one of plurality of block areas is fixed-length,
 said information recording apparatus further comprises a size judging device for judging whether or not a size of the record information to be recorded are larger than a size of the at least one block area, and
 said first controlling device controls said recording device to divide

and record the record information to be recorded, if it is judged by said size judging device that the size of the record information to be recorded are larger than the size of the at least one block area.

5 16. The information recording apparatus according to claim 15, further comprising an ejection judging device for judging whether or not said information recording medium is ejected from said information recording apparatus, and

10 said first controlling device controls said recording device, if the record information is not recorded in at least one portion of the at least one fixed-length block area, to record dummy data into the at least one portion of the at least one fixed-length block area.

15 17. The information recording apparatus according to claim 10, wherein at least one of plurality of block areas is variable-length,

said information recording apparatus further comprises a determining device for determining a size of the at least one variable-length block area, on the basis of a size of the record information to be recorded, and

20 said first controlling device controls said recording device to record the record information to be recorded into the at least one variable-length block area having the size determined by said determining device.

25 18. The information recording apparatus according to claim 10, wherein the plurality of block areas include at least one fixed-length block area and at least one variable-length block area,

said information recording apparatus further comprises a measuring

device for measuring a size of the record information to be recorded, and

5 said first controlling device controls said recording device to record the record information into the at least one variable-length block area if the size of the record information to be recorded measured by said measuring device is equal to or larger than a predetermined size, and said first controlling device controls said recording device to record the record information into the at least one fixed-length block area if the size measured by said measuring device is smaller than the predetermined size.

10 19. The information recording apparatus according to claim 10, wherein

said information recording medium has a pre-record address continuously given in said first recording layer and said second recording layer, the pre-record address determining a position where the record information is recorded on said information recording medium, and

15 said information recording apparatus further comprises an address giving device for giving a physical address recorded with the record information onto said information recording medium, so as to be continuous in each of the plurality of block areas.

20 20. The information recording apparatus according to claim 10, wherein

said information recording medium has a pre-record address continuously given in said first recording layer and said second recording layer, the pre-record address determining a position where the record information is recorded on said information recording medium, and

25 said information recording apparatus further comprises an address giving device for giving a physical address recorded with the record

information onto said information recording medium, so as to be proportional to the pre-record address.

21. The information recording apparatus according to claim 10, wherein
5 said information recording medium has a pre-record address continuously given in said first recording layer and said second recording layer, the pre-record address determining a position where the record information is recorded on said information recording medium, and

10 said information recording apparatus further comprises a second controlling device for controlling said recording device, to record discontinuity point information which indicates a discontinuity point of a relationship between a logical address, used when at least one of recording and reproduction of the record information is performed in each of the plurality of block areas, and a physical address recorded with the record information onto
15 said information recording medium, into a management information area to record therein management information for managing the record information, and to record at least one of the record information and reproduction control information for controlling reproduction of the record information such that the logical address is continuous in each of the plurality of block areas.

20

22. The information recording apparatus according to claim 10, wherein
said information recording medium has a pre-record address continuously given in said first recording layer and said second recording layer, the pre-record address determining a position where the record information is recorded on said information recording medium, and has discontinuity point information recorded in advance, the discontinuity point

information indicating a discontinuity point of a relationship between a logical address, used when at least one of recording and reproduction of the record information is performed in each of the plurality of block areas, and a physical address recorded with the record information onto said information recording medium, and

5 said information recording apparatus further comprises a third controlling device for controlling said recording device to record at least one of the record information and reproduction control information for controlling reproduction of the record information by using the logical address having a
10 fixed relationship with the physical address which is proportional to the pre-record address.

23. The information recording apparatus according to claim 10, wherein
 said information recording medium has a pre-record address
15 continuously given in each of the plurality of block areas, the pre-record address determining a position where the record information is recorded on
 said information recording medium, and

20 said information recording apparatus further comprises a fourth controlling device for controlling said recording device to record at least one of the record information and reproduction control information for controlling reproduction of the record information such that a logical address used when at least one of recording and reproduction of the record information is performed is continuous in each of the plurality of block areas.

25 24. The information recording apparatus according to claim 10, wherein
 said information recording medium has a pre-record address

continuously given in each of the plurality of block areas, the pre-record address determining a position where the record information is recorded on said information recording medium, and

5 said information recording apparatus further comprises a fifth controlling device for controlling said recording device, to record at least one of the record information and reproduction control information for controlling reproduction of the record information such that a logical address used when at least one of recording and reproduction of the record information is performed is proportional to the pre-record address.

10

25. An information recording method comprising:

15 a recording process of recording record information onto an information recording medium comprising: a first recording layer and a second recording layer in each of which the record information can be recorded; and

20 a first controlling process of controlling said recording process to record the record information by a unit of each of a plurality of block areas, each of which includes a partial recording area of said first recording layer and a partial recording area of said second recording layer located in a position facing the partial recording area of said first recording layer.

25. A computer program for record control to control a computer provided for the information recording apparatus according to claim 10, to make the computer function as at least one portion of said recording device and said first controlling device.